ORGDP NONRADIOACTIVE LIQUID EFFLUENTS

Nonradioactive liquid wastes from the ORGDP are discharged to the Clinch River and Poplar Creek via eight separate discharge streams. In addition, more than 50 storm drain effluents provide for discharge of surface runoff and once-through cooling water. Since the storm drains do not normally contain industrial or domestic sewage wastes, they are not routinely monitored and thus are not discussed in this paper.

The general locations of the eight effluent streams are shown in Figure 1. The K-1700 effluent enters Poplar Creek at a rate of about 850 gpm approximately 500 ft. downstream of Blair Bridge. Figure 2 is a photograph of this effluent. The primary contributors to the discharge are the K-1420 decontamination and Uranium recovery operations, the K-1401 metals cleaning operation, K-1413 development activities, the K-1302 nitrogen production facility, the K-1501 steam plant and its associated coal pile runoff, the K-1037 cooling water blowdown, and surface runoff from the northeastern region of the plant (Figure 1).

The treatment systems dedicated to this effluent consist of typical neutralization precipitation facilities. A small batchwise neutralization pit treats the acidic ion exchange backwash from the steam plant's water treatment system and subsequently discharges it into the K-1407-B holding pond where the insoluble solids are allowed to settle. Acidic and caustic cleaning wastes from K-1401 and K-1420, the caustic scrubber solution from the nitrogen plant scrubber (K-1302), and acidic and caustic wastes from the K-1413 development facility are all neutralized in the K-1407-A neutralization pit prior to being discharged to the K-1407-B holding pond. This larger neutralization pit is equipped with a continuous pH measuring system and remote-controlled sulfuric acid and lime addition systems (Figure 3). The K-1407-B pond effluent weir is equipped with a continuous pH monitoring system that will automatically close a vertical gate when the pH range of 6.0 to 9.0 is exceeded. The pond effluent pH can then be adjusted by pumping a neutralizing solution from the K-1407-A pit (Figure 2

The parameters considered to be indicative of the quality of the K-1700 effluent are listed in Table I. In the past, problems have arisen in continuously controlling chromium, nitrate and pH. The chromium was discharged from the K-1037 cooling system where it was used as a corrosion inhibitor. In June of 1977, the chromium-containing water treatment was replaced with a non-chromium, polyphosphorate treatment that does not present an environmental problem.

Nitrates are a routine waste from both the uranium decontamination and recovery operations. In the past all of this material was discharged to the K-1407-B from where it flowed through K-1700 to Poplar Creek. During the past year more than 60 percent of the nitrates have been collected and transported to Y-12. This operation has been successful in maintaining compliance with the NPDES permit limit of 20 mg/l of nitrate nitrogen. Additional collection systems are budgeted for 1980 in an effort to further reduce the K-1700 nitrate level.

The continuous control of the K-1700 effluent pH has proven to be a very difficult task. All the process discharges are now routed through neutralization facilities that are currently providing extremely good control. However, the acidic runoff from the steam plant coal pile which is mixed with the caustic blowdown from the boilers continues to result in occasional low pH values, especially during periods of steady rainfall. Recently, efforts have been initiated to supply more blowdown to the coal pile runoff in order to better adjust its pH. Should this attempt fail, other means such as large scale neutralization may be required.

ORGDP MONITORING PROGRAMS

M. E. Mitchell

ABSTRACT - A summary of the ORGDP effluent and environmental monitoring programs is presented. Applicable flow diagrams and photographs of equipment is also included. Environmental data are compared with existing regulations and/or guidelines.

OUTLINE

I. INTRODUCTION

General discussion of difference between environmental and effluent monitoring programs, monitoring philosophy, number of monitoring stations and parameters, use of data

II. DESCRIPTION OF MONITORING PROGRAMS

A. Effluent Monitoring

1. Liquid effluent monitoring locations, parameters, use of data, problems
2. Gaseous effluent monitoning - Same as for 1

B. Environmental Monitoring

1. Surface stream monitoring - location, parameters, use of data, problems
2. Surface stream sediment monitoring - same as for 1
3. Soil and vegetation monitoring - same as for 1
4. Atmospheric monitoring - same as for 1
5. Proposed subsurface water monitoring - same as for 1

III. COMPLIANCE WITH APPLICABLE STANDARDS AND GUIDLINES

ORGDP RADIOACTIVE LIQUID EFFLUENTS

M. E. Mitchell

ABSTRACT: A summary of ORGDP radioactive liquid effluents is presented. Each of of the four discharge streams is described in detail, with special emphasis being placed on past, current, and potential problems. Applicable flow diagrams and tabulated data are also included for each effluent.

OUTLINE

I. INTRODUCTION
- Number of effluent locations
- Sources
- Nuclides of interest
- Characteristics of receiving streams
- Flow
- Temperature
- Elev., etc.

II. DESCRIPTION OF INDIVIDUAL EFFLUENTS, INCLUDING TREATMENT PROBLEMS

A. K-1700
- Contributors
- Nuclides
- General Treatment Methods
- Data
- Problem Areas
- Tc-99

B. K-1203 - Same as K-1700
- No Problems

C. K-1007-B - Same as K-1700
- No Problems

D. K-901-A - Same as K-1700
- No current Problems

ORGDP NONRADIOACTIVE LIQUID EFFLUENTS

M. E. Mullins

ABSTRACT - A summary of ORGDP nonradioactive liquid effluents is presented. special emphasis is placed on past and current problem areas and the means that have been and/or will be taken to correct these problems. Tabulated data for each effluent is included along with applicable flow diagrams and photographs.

OUTLINE

I. INTRODUCTION
   Number of monitored effluent locations
   Relative number of unmonitored storm drains

II. DESCRIPTION OF INDIVIDUAL EFFLUENTS, INCLUDING PROBLEMS
   A. K-1700
      Contributors
      Parameters
      General Treatment Systems
      Data
      Monthly Max. Avg.
      Problems and Solutions
      NO_3
      pH
      Cr
   B. K-1410 - Same as K-1700
      Problems
      Solutions
      pH
      Ni
   C. K-1131 - Same as K-1700
      No Problems
   D. K-1203 - Same as K-1700
      Problems & Solutions
      Infiltration Related
      BOD
      S.S.
      Chlorine Residual

E. K-1007-B - Same as K-1700
   Problems & Solutions
   pH
   D.O.
   COD

F. K-901-A - Same as K-1700
   Problems & Solutions
   pH
   Cr

G. K-710 - Same as K-1700
   Problems & Solutions
   Chlorine Residual
   BOD
   S.S.

H. K-1515 - Same as K-1700
   No Problems

ORGDP GASEOUS EFFLUENTS

T. E. Bard

ABSTRACT- A summary of all ORGDP gaseous effluents is presented. Each discharge is described in terms of discharge quantities, abatement equipment, and past, current, and potential problems. Applicable flow diagrams and photographs are also included for each source.

OUTLINE

I. INTRODUCTION
- Total number of gaseous effluents
- Major effluents
- Parameters of interest
- General characteristics of atmosphere
- Wind rose data
- Stability data, etc.

II. DESCRIPTION OF MAJOR SOURCES, INCLUDING PROBLEMS

A. Steam Plant - Size, current and future fuel requirements, existing and planned abatement systems, past and projected emission data, flow diagrams and photographs
current construction status and schedule

B. Diffusion Purge Cascade - General function description
Flow diagram
Pollutants
Scrubber system flow diagram and description
Scrubber removal data
Disposition of scrubber wastes
Problems - pH control and subsequent corrosion protection of equipment
Planned correction - Molecular Sieve

T. E. Bard (Continued)

C. K-1420 - Flow diagrams of decontamination and recovery operation
Abatement Systems
Discharge data
No real problems

D. Fluorine Plant - Flow diagram showing effluents
Existing and planned abatement systems
Systems
Discharge data
Problems? (Including potential scrubber problems)

E. L-Lab - Same as Fluorine Plant

F. CTF and CPDF - Same as Fluorine Plant

ORGDP SOLID WASTE DISPOSAL

T. A. Bowers

ABSTRACT- A general summary of the ORGDP solid waste management/disposal program is presented. Specific procedures for handling radioactive, classified, hazardous, and metallic wastes are described. Photographs of the various disposal facilities are also included.

OUTLINE

I. INTRODUCTION
- Different types of solid wastes
- Philosophy regarding personnel and environmental protection
- Average quantities of solid wastes handled
- General statement of number of different types of materials and disposal methods

II. DESCRIPTION OF INDIVIDUAL DISPOSAL PROGRAMS

A. Unclassified Scrap Metal
- Procedure
- Description
- Storage Area
- Quantities
- Monitoring (Including data)
- Problems
- Enormous volume for storage
- Radioactive release to C.R?
- Administrative Control

B. Hazardous Wastes
- Procedure
- Disposal sites
- Quantities
- Monitoring
- Problems
- Administrative Control

C. Classified Waste
(Same as for B)

D. Contractors' Spoil
(Same as for B)

E. Landfill
Type waste
(Same as for B)